

CLAIMS

What is claimed is:

1. Device for muscle stimulation comprising:
 - a pulse generator unit (9) for generating and transmitting an electric stimulation pulse;
 - a control unit (10) for controlling the pulse generator unit (9) for setting amplitude and frequency of the stimulation pulses and for causing stimulation pulses to be applied to a muscle to be stimulated;
 - a detection unit (11) for detecting the instantaneous, spontaneous or stimulated heart rhythm of the wearer of the device;
 - a housing (12) for receiving the pulse generator unit (9), the control unit (10) and the detection unit (11);
 - characterized in that
 - a counting unit (13) and a memory unit (14) for counting and storing the number of stimulation pulses transmitted during a defined time interval, and
 - a determination unit (15) for determining an arithmetically averaged (mean) stimulation frequency within the definable time interval are provided, wherein the mean stimulation frequency is computed as the quotient of the stimulation pulses transmitted during the defined time interval and stored in the memory unit (14) and the defined time interval in which the stimulation pulses are counted and stored.
2. Device according to claim 1, comprising a continuously operating evaluation unit for observing limit values for the mean stimulation frequency, wherein the limit values can be individually set in a range between 0.2 stimulation pulses per second and 2 stimulation pulses per second, and pulse conservation means (16) for reducing the mean stimulation frequency as a function of the maximum mean stimulation frequency preset in the evaluation unit.

3. Device according to claim 2, characterized in that the pulse conservation means (16) comprise a computing unit (17) for computing a stimulation pattern according to an equation which determines the stimulation pattern as a function of the mean stimulation frequency.
4. Device according to one of the claims 1 to 3, comprising a memory module (21) for storing the temporal course of the number of transmitted stimulation pulses.
5. Device according to one of the claims 1 to 4, comprising means for program-controlled transmission of the mean stimulation frequency from the determination unit to the evaluation unit.
6. Device according to one of the claims 1 to 5, comprising an analysis unit (22) for determining how often and when certain limit values of the heart rate and/or of the mean stimulation frequency are exceeded or underrun.
7. Device according to one of the claims 1 to 6, characterized in that the counting unit (13) and the memory unit (14) are received in the housing (12).
8. Device according to claim 7, characterized in that the determination unit (15) and/or the pulse conservation means (16) are integrated in the housing (12) which receives the control unit (10).
9. Device according to claim 8, characterized in that the memory module (21) and/or the analysis unit (22) are integrated in the housing (12) which receives the control unit (10).

10. Device according to one of the claims 1 to 6, characterized in that the counting unit (13) and/or the memory unit (14) and/or the determination unit (15) and/or the pulse conservation means (16) and/or the memory module (21) and/or the analysis unit (22) are a part of a stationary monitoring unit (23) and/or a monitoring unit (23) worn by the wearer of the device external to the body.
11. Device according to claim 10, characterized in that the mean stimulation frequency and/or the order of magnitude in which the mean stimulation frequency falls, is optically and/or acoustically and/or haptically displayed on the monitoring unit (23) by display means.
12. Device according to claim 10 or 11, characterized in that the monitoring unit (23) comprises a programming unit (24) located in the housing (12) that receives the control unit (10) for generating a programming signal and a transmission unit for transmitting the programming signal to a send and receive unit (19).
13. Device according to one of the claims 10 to 12, characterized in that the monitoring unit (23) includes means (25) for sending and receiving position data.
14. Device according to one of the claims 10 to 13, characterized in that the monitoring unit (23) includes means (26) for sending and receiving wireless signals for the purpose of transmitting patient-physiological data to a display and evaluation unit of a receiver.
15. Device according to one of the claims 1 to 14, characterized in that the pulse generator unit (5) is capable of transmitting biphasic stimulation pulses.

16. Device according to one of the claims 1 to 15, characterized in that an energy storage device located in the housing (12) can be charged transcutaneously.
17. Device according to one of the claims 1 to 16, characterized in that the definable time interval is at least 30 minutes.
18. Device according to one of the claims 1 to 17, characterized in that the definable time interval is at least 12 hours.
19. Device according to one of the claims 1 to 18, characterized in that the definable time interval is at least 24 hours.